

7. A method as in claim 1, wherein the electrical transient is tissue impedance and the at least one characteristic of said electrical transient is a rate of change of the tissue impedance.

5 8. A method as in claim 1, wherein the RF energy parameters that are varied for individual pulses of the subsequent RF energy pulses comprise RF power output, current and voltage.

10 9. A method as in claim 1, further comprising the step of determining if the tissue responded to the first pulse of RF energy prior to the step of applying at least one subsequent RF energy pulse.

15 10. A method as in claim 9, wherein the step of applying at least one subsequent RF energy pulse includes the step of varying at least one of RF starting power, a magnitude of starting current, and a magnitude of starting voltage for the at least one subsequent RF energy pulse.

11. A method as in claim 1, further comprising the steps of:
measuring the at least one characteristic of the electrical transient that occurs at the end of
20 one of the first pulse and the at least one subsequent RF energy pulse;
in accordance with the measured characteristic, determining whether to terminate the method for electrosurgically sealing tissue, or using the measured characteristic to determine a set of RF energy parameters for a subsequent RF energy pulse and repeating the applying step.

25 12. A method as in claim 11, wherein the set of RF energy parameters for the subsequent RF energy pulse comprise a magnitude of a starting RF power, a magnitude of a starting current, a magnitude of a starting voltage, and a duty cycle.

30 13. A method as in claim 11, wherein the electrical transient is an electrical impedance of the tissue.

14. A method as in claim 13, wherein the step of using the measured characteristic to determine the set of RF energy parameters for the subsequent RF energy pulse comprises a step of using the measured impedance value to readout the set of RF energy parameters from an entry in one of a plurality of lookup tables.

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15. A method as in claim 10, wherein said one of the plurality of lookup tables is selected manually or automatically, based on a choice of an electrosurgical tool or instrument.

16. A method as in claim 3, further comprising the step of modifying predetermined
10 pulses of the set of RF energy parameters in accordance with a control input from an operator.

17. A method as in claim 16, wherein the predetermined pulses of the set of RF energy parameters that are modified comprise a pulse power and a pulse starting voltage.

15 18. A method as in claim 1, further comprising the step of terminating a generation of subsequent RF energy pulses upon a determination that the electrical transient is absent.

19. A system for electrosurgically sealing tissue, comprising an electrosurgical generator comprising an RF energy source and a controller for controlling the operation of an
20 electrosurgical generator, said electrosurgical generator having an output for coupling to a surgical instrument comprising electrodes for coupling RF energy generated by said electrosurgical generator to tissue to be sealed; said controller being operable for causing said electrosurgical generator to apply an initial pulse of RF energy to the tissue and for measuring a value of an electrical characteristic of the tissue in response to the applied initial pulse, said
25 controller being responsive to the measured electrical characteristic for determining an initial set of pulse parameters for at least one subsequent pulse and for then varying the pulse parameters of individual pulses of further subsequent RF energy pulses in accordance with a change in the electrical characteristic of the tissue as determined from at least one characteristic of an electrical transient that occurs during each individual pulse of the subsequent RF energy pulses.

20. A system as in claim 19, wherein the electrical characteristic is comprised of an electrical impedance.

21. A system as in claim 19, wherein the at least one characteristic of the electrical
5 transient is the rate of change of the electrical transient.

22. A system as in claim 19, wherein said initial set of pulse parameters comprise a magnitude of starting power and a magnitude of a starting voltage.

10 23. A system as in claim 19, wherein said subsequent RF energy pulses are each varied in amplitude by a controlled amount from a previous RF energy pulse.

24. A system as in claim 19, further comprising one of a plurality of pulse parameter lookup tables that is readably coupled to said controller, and wherein said controller, when
15 determining said initial set of pulse parameters, uses said impedance value to readout said initial set of pulse parameters from said one of the plurality of pulse parameter lookup tables.

25. A system as in claim 19, wherein said one of a plurality of pulse parameter lookup tables is selected manually or automatically, based on a choice of an electrosurgical tool or
20 instrument.

26. A system as in claim 19, wherein said controller is responsive to a control input from an operator for modifying any one of said pulse parameters.

25 27. A system as in claim 19, wherein said controller is responsive to a determination that said electrical transient is absent for terminating a generation of subsequent RF energy pulses.